AIR MONITORING PLAN

Old American Zinc Plant Superfund Site
Surrounding Properties Remedial Design
St. Clair County, Illinois

IN SUPPORT OF

CONTRACT W912P9-18-D-0014

DELIVERY ORDER NUMBER W912P919F0060

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PREPARED FOR:

US Army Corps of Engineers ®
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Environmental & Munitions Branch (CEMVS-EC-E)
Environmental Quality Section (CEMVS EC-EQ)
Foot of Arsenal Street
St. Louis, MO 63118

PREPARED BY:

ARDL Inc.
Environmental | Analytical | Management | Safety

ARDL, Inc
400 Aviation Drive
PO Box 1566
Mount Vernon, IL 62864

APPROVAL PAGE

Approved by: _____ 4/30/19
Robert Dismang, Project Manager — Date
ARDL

Approved by: _____ 4/30/19
Valerie Jenkins, President — Date
ARDL

Approved by: _____
Pedro A. Rosario-González, Civil Engineer — Date
USACE – St. Louis

Approved by: _____
Kevin Slattery, Program Manager — Date
USACE – St. Louis

Approved by: _____
Sheila Desai, Remedial Project Manager — Date
USEPA

Approved by: _____
Michael Haggitt, Remedial Project Manager — Date
IEPA

Arsenic, Cadmium, Lead, Zinc, and PM 10 Air Sampling Plan

Personal and perimeter air sampling will be performed during upcoming excavation activities at the surrounding residential property of the Old American Zinc Plant Superfund Site for contaminants of concern (COCs), which include arsenic, cadmium, lead, and zinc. All integrated samples will be collected and analyzed in accordance with industry standard methods by an accredited laboratory. Real-time perimeter dust monitoring shall also be performed for PM10 with conservative action levels based on maximum concentrations of contaminants (0.5 mg/m^3). The dust monitoring data will also be evaluated against the USEPA National Ambient Air Quality Standards (NAAQS) for PM10 (0.15 mg/m^3).

The contractor shall be responsible for collecting personal samples from contractor staff and performing perimeter monitoring at properties within the Residential Area and the Facility Area (FA) near the borrow material staging pile and excavated material staging pile, as required by this sampling plan, health and safety plans (owner representative's and contractor's), and any applicable federal, state, or local regulations. The contractor shall also be responsible to perform real-time dust monitoring during intrusive activities at each property and the excavated soil staging pile, beginning with excavation and continuing through backfill and topsoil placement.

Personal Air Sampling

Sampling Approach

A personal air sample will be collected for a worker with the greatest potential exposures during the excavation activities for each property during the first week of excavation activities. The intent of the personal air sampling is to document the highest risk of occupational exposure levels and verify the adequacy of the established personal protection equipment (PPE) levels. If warranted by the data, actions could range from no action, to increased personal sampling, or modifications to administrative or engineering controls and or PPE . Note that based on experience at similar projects, changes in proposed PPE levels are not anticipated. The quickest laboratory turnaround time for results shall be confirmed and used (anticipate a 24-hour laboratory turnaround).

Based on the results of the first week of personal air sampling, the sampling plan will also be reviewed to evaluate the effectiveness of the monitoring for the remainder of the field activities. If the project action level is reached for any compound, monitoring will continue using the initial sampling approach as previously described. Factors that will be considered include, but are not limited to, the following: (1) results of the first round of personal air sampling, (2) level of soil contamination anticipated in future excavations based on previous soil sampling data, (3) soil conditions (wetness) anticipated, (4) level of work activity anticipated, and (5) correlation of real-time dust monitoring (see below) with actual personal air sampling results obtained.

Sampling Method

Personal air samples will be collected in accordance with NIOSH Method 7303 or equivalents using a 0.8-µm mixed cellulose ester (MCE) membrane filter. A calibrated sampling pump will be used to draw a representative air sample from the breathing zone of the employee through the filter to collect the airborne particulate. The calibrated sampling pumps will sample within +/- 5 percent of the recommended flow rate of 1 to 4 liters per minute. Tygon or other flexible tubing will be used for connecting to the pumps. Samples will be collected for an approximate 8-hour period or a full- shift period, resulting in a total air volume of approximately 960 liters using a nominal flowrate of 2 liters per minute (Lpm). Samples would be handled under standard chain-of-custody procedures for laboratory analysis.

Perimeter Air Sampling

Sampling Approach

Daily perimeter air samples for arsenic, cadmium, lead, and zinc will be collected at two locations per property, typically at the residence and downwind. At the FA near the borrow material staging pile and excavated material staging pile, two perimeter air samples will also be collected daily while earthwork is being performed or when the staging pile is being constructed. The sampling locations at the excavated soil staging pile will be selected to evaluate both ambient (i.e., upwind) and downwind levels. The intent of the perimeter sampling is to provide assurances that exposures outside the exclusion zone do not pose an unacceptable risk to the public or workers in the support zone. An expedited laboratory turnaround time for results shall be confirmed and used (anticipate a 2-3 day laboratory turnaround).

Sampling Method

Personal air samples will be collected in accordance with NIOSH Method 7303 or equivalents using a 0.8-µm mixed cellulose ester (MCE) membrane filter. A calibrated sampling pump will be used to draw a representative air sample through the filter to collect the airborne particulate. The calibrated sampling pumps will sample within +/- 5 percent of the recommended flow rate of 1 to 4 liters per minute. Tygon or other flexible tubing will be used for connecting to the pumps. Sample collection time and volume will be in accordance with the referenced NIOSH method. Samples would be handled under standard chain-of-custody procedures for laboratory analysis.

Real-time Perimeter Dust Monitoring

Sampling Approach

Real-time dust monitoring will be performed using MIE DataRAM 4 (DR-4000) dust monitors, or equivalent (i.e. TSI Dustrak 8530, etc.), throughout the duration of intrusive activities beginning with excavation and continuing through backfill and topsoil placement at each property and the FA excavated soil staging pile while earthwork is being performed or when the staging pile is being constructed. All dust monitors shall be protected from precipitation and other elements using an appropriate environmental enclosure (i.e. TSI Environmental Enclosure 8535 or equivalent).

Each day at the residential properties being worked on, the dust monitors will be set-up at the front door and a downwind property line location to verify effectiveness of engineering controls in minimizing dust generation that may potentially leave the exclusion zone. Additional dust monitors will be placed upwind and downwind of the FA excavated soil staging pile. Final placement and adjustment to these locations will be made at the discretion of the ARDL representative. The dust monitor measurements will be recorded every minute and contractor personnel will check readings every 30 minutes, along with a brief description of the activity taking place. Additionally, the dust monitor results will be downloaded each day so that the fluctuations in total dust concentrations can be observed.

During work hours, the dust monitor alarm will be set at 0.5 mg/m^3 to observe activities and determine the cause for elevated particulate concentrations and to evaluate potential mitigation measures to maintain the 24-hour average concentration below the criteria. A health and safety dust-monitoring action limit of 0.5 mg/m^3 was determined based on the maximum COC concentrations detected in samples during the remedial investigation and predesign sampling. Exceedances of the dust monitoring criteria require dust-abatement measures, typically application of water, or stop work and further evaluation. As previously indicated, the dust monitoring data will also be evaluated against the USEPA National Ambient Air Quality Standards (NAAQS) for PM10 of 0.15 mg/m^3.

Notification of Personal and Perimeter Air Monitoring Results

Notification Procedures

The analytical laboratory will submit sample results directly to the contractor for each of their personnel included in this air sampling program. The contractor will comply with Occupational Safety and Health Administration standards 1910.120 and 1910.1026 regarding employee notification and recordkeeping requirement and will provide the owner's representative with a weekly summary of results and real-time notification of any exceedances.

Recordkeeping

Documentation of air monitoring and air sampling must be retained as part of the project file, which includes the following:

- Calibration and industrial hygiene sampling logs
- Instrument reading
- Weather conditions
- Sample location (breathing zone, headspace) and upwind and downwind locations at properties and the FA.
- Operator's name and signature
- Date and time of the samples, copies of chain of custody forms
- NIOSH methods used
- Laboratory analysis reports
- Copies of personnel notification of results

Submissions

File results will be submitted in Microsoft Excel 2013 readable format. File names denoting address being sampled, sample meter location (i.e., upwind or downwind), and sample date will be submitted daily.

Analytical results from personal sampling pumps will be reported in Adobe Acrobat 9.0 or compatible software. The reports will denote sample collection intervals, volumes, and addresses where personal samples were collected. The personal analytical results will be submitted monthly.